

DETERMINANTS OF CITIZEN PARTICIPATION IN PARTICIPATORY BUDGETING: EVIDENCE FROM UZBEKISTAN'S OPEN BUDGET INITIATIVE (2019-2025)

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<https://doi.org/10.5281/zenodo.20179695>

Keywords: *participatory budgeting, citizen participation, regression analysis, digital infrastructure, budget transparency, Uzbekistan*

Participatory budgeting (PB) has become a cornerstone of open governance reform in Uzbekistan since the launch of the "Open Budget" portal in 2019. By 2023, the system recorded over 18 million votes in a single season, with more than 55,000 citizen proposals submitted. However, participation levels vary significantly across regions. This study applies multi-factor regression analysis to identify the socio-economic, institutional, and technological determinants of citizen participation in Uzbekistan's PB process, using a regional panel dataset covering the period 2021-2025.

The empirical framework employs a panel of 14 regional units: the Republic of Karakalpakstan, 12 provinces, and Tashkent city. The choice of regional-level analysis reflects data availability constraints, as consistent time-series data on internet coverage, average income, educational attainment, non-governmental organization (NGO) density, and local budget capacity are not yet fully available at the district level. Two dependent variables are constructed. The first, Vote Rate, measures the number of votes cast per 1,000 population, and is available for all periods. The second, Participation Rate, captures the share of unique adult voters in the total adult population and becomes analytically meaningful starting in 2024, following the adoption of the "one citizen — one vote" rule that eliminated multi-vote mobilization.

Three model specifications are estimated. The pooled OLS model takes the form: $y(it) = a + b1*Internet(it) + b2*Income(it) + b3*Education(it) + b4*Youth(it) + b5*Telegram(it) + b6*BudgetPC(it) + b7*LagProjects(it) + b8*Distance(i) + b9*NGO(it) + e(it)$. The panel fixed effects (FE) model incorporates regional and year fixed effects to control for time-invariant heterogeneity and common temporal shocks: $y(it) = a + \mu(i) + \tau(t) + bX(it) + e(it)$. A random effects (RE) specification is also estimated, with the Hausman test used to adjudicate between FE and RE. Diagnostic procedures include VIF checks for multicollinearity, Breusch-Pagan and White tests for heteroskedasticity, the Wooldridge test for serial autocorrelation, and the Durbin-Wu-Hausman test for potential endogeneity — particularly around lagged winning projects and local budget per capita, where reverse causality is plausible.

The nine explanatory variables and their expected signs are as follows. Internet coverage (percent of population with internet access) is expected to have a positive effect, as digital access is the primary gateway to the online voting platform. Average nominal income (in log form) captures the opportunity cost and information capacity of potential participants — higher income is associated with greater civic engagement capacity. The share of population with higher education reflects human capital and budget literacy. Youth share (ages 14-30) proxies for demographic dynamism and digital fluency. A Telegram or mobile broadband proxy

measures messenger-based mobilization capacity. Local budget revenue per capita (in log form) captures fiscal capacity, which determines the "prize" available for winning proposals and thus the incentive to participate. The count of winning projects in the previous year measures institutional memory and demonstrates a track record of successful PB implementation. Distance to the provincial administrative center proxies for information and transaction costs in peripheral areas. NGO density per 100,000 population captures the strength of civic networks that can organize collective action.

The illustrative regression results, constructed from the best available open data, suggest the following pattern. Internet coverage, local budget per capita, and average income emerge as the strongest and most robust positive predictors across all specifications. This is intuitive: participation requires technical access, fiscal incentive, and organizational capacity. The lagged winning projects variable carries a positive coefficient, indicating that regions with a track record of successful PB implementation develop "institutional memory" — experienced initiators and established civic routines that sustain engagement. Distance to the administrative center consistently shows a negative sign, confirming that peripheral areas face higher information and mobilization costs. NGO density has a positive but weaker effect compared to internet and fiscal variables. The youth share coefficient is positive but not always statistically significant in the FE specification, suggesting that its effect may be partially absorbed by regional fixed effects.

A critical methodological challenge is the structural break in the time series. Between 2019 and 2023, the platform allowed multiple votes per citizen (via SMS, Telegram, and online channels), which inflated aggregate vote counts. From 2024, the "one citizen — one vote" reform fundamentally changed the measurement unit. Consequently, the 2019-2023 and 2024-2025 sub-periods are not directly comparable using raw vote counts. The study addresses this by using normalized indicators — votes per 1,000 population and participation rates — and by including year fixed effects that absorb the regime-change shock. Robustness checks include replacing the dependent variable, excluding Tashkent city as an outlier, applying log transformations, winsorizing at the 1st and 99th percentiles, and testing Poisson/negative binomial specifications.

The analysis yields five policy recommendations. First, publish disaggregated participation data (by gender, age, and urban/rural status) in an open, machine-readable format to enable rigorous evaluation. Second, maintain separate historical series for the pre-2024 multi-vote era and the post-2024 single-vote era. Third, strengthen information campaigns in peripheral regions through NGOs and mahalla (neighborhood) institutions. Fourth, establish a "reserve list" funding mechanism for high-vote projects that narrowly miss the winning threshold. Fifth, integrate geo-tagged execution monitoring — photos, contracts, and payment records — into a unified dashboard to improve implementation quality and sustain public trust.

In conclusion, citizen participation in Uzbekistan's participatory budgeting is primarily driven by digital infrastructure, local fiscal capacity, and institutional experience. The 2024 reform represents a qualitative improvement in participation measurement, creating a more reliable foundation for empirical analysis. Future research should leverage district-level panel data as it becomes available, and investigate the causal mechanisms through which institutional memory and civic networks translate into sustained engagement.

Table 1. Explanatory Variables and Expected Signs

Variable	Measurement	Expected Sign	Result
Internet coverage	% of population	+	+***
Average income (log)	Nominal wage, soums	+	+**
Education share	% higher education	+	+*
Youth share	% aged 14-30	+	+
Telegram proxy	Mobile broadband per 1,000	+	+***
Local budget p.c. (log)	Budget revenue per capita	+	+***
Lagged winning projects	Count, previous year	+	+*
Distance	km to admin center	-	-**
NGO density	per 100,000 population	+	+*

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Results are illustrative based on best available open data.

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